



## Serial Debridement vs. Daily Dressings in Patients Who Underwent Debridement for Necrotizing Fasciitis

Zahid Ali Memon<sup>1\*</sup>, Amber Shabih<sup>2</sup>, Zahida Ismail<sup>1</sup>, Syeda Zubaria Qamar<sup>1</sup>, Iqra Anees Rajput<sup>1</sup>, Sidra Anees<sup>3</sup>, Muthar Anees<sup>4</sup>, Muhammad Umair Qadir<sup>1</sup>, Noman Ahmed Khan<sup>1</sup>

### Abstract

**Introduction:** Necrotizing fasciitis is a severe soft tissue infection that requires prompt surgical intervention, including extensive debridement. However, the optimal post-debridement wound care protocol remains debatable.

**Purpose:** This study aimed to compare the outcomes between patients who underwent serial debridement and those who received daily wound dressings after debridement.

**Method:** We retrospectively analyzed medical records from a tertiary care center over two years.

**Result:** Our results suggest that serial debridement may offer superior clinical outcomes and decreased morbidity compared with daily dressings in these patients.

**Conclusion:** In patients with necrotizing fasciitis, serial debridement appears to be a more effective approach to post-debridement wound management when compared to daily dressings.

**Keywords:** Serial debridement; Necrotizing fasciitis management; Daily dressings; Soft tissue infection; Surgical intervention; Fascial necrosis

### Introduction

Necrotizing fasciitis is a rapidly progressing, potentially life-threatening soft tissue infection characterized by widespread fascial necrosis [1]. Timely surgical debridement is the cornerstone of the treatment [2]. However, the post-debridement wound management protocol varies widely among clinicians, with some advocating for serial debridement and others opting for daily wound dressings. This study investigates which approach yields better clinical outcomes in patients with necrotizing fasciitis.

**Serial Debridement:** Serial debridement involves multiple surgical interventions to remove necrotic tissue in a staged manner. The rationale behind this approach is to gradually eliminate infected tissue while preserving healthy tissue, thereby facilitating wound healing. Proponents of serial debridement argue that it allows for thoroughly removing necrotic material and reduces the risk of residual infection [3]. Additionally, staged debridement may help in assessing the extent of tissue involvement and adapting the treatment strategy accordingly. However, critics highlight the potential drawbacks of repeated surgical interventions, including increased healthcare costs, prolonged hospital stays, and added surgical risks.

### Affiliation:

<sup>1</sup>Dow University of Health Sciences, Karachi, Sindh, Pakistan

<sup>2</sup>Sindh Government Qatar Hospital, Karachi, Sindh, Pakistan

<sup>3</sup>Bahria University Medical and Dental College, Karachi, Sindh, Pakistan

<sup>4</sup>Liaquat College Of Medicine and Dentistry, Karachi, Sindh, Pakistan

### \*Corresponding author:

Noman Ahmed Khan, Dow University of Health Sciences, Karachi, Sindh, Pakistan.

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**Daily Dressings:** Alternatively, daily dressings involve the application of topical antimicrobial agents and wound care management without the need for repeated surgical interventions. Advocates of this approach emphasize its simplicity, cost-effectiveness, and potential for early mobilization of patients. Daily dressings may promote wound healing by providing a moist environment, controlling infection, and facilitating granulation tissue formation [4]. Moreover, this non-invasive method may reduce the burden on healthcare resources and minimize the risk of surgical complications. Nonetheless, skeptics argue that daily dressings may not adequately address deep-seated infections or effectively remove necrotic tissue, potentially leading to delayed wound healing and recurrent infections [5].

## Methods

**Study Design:** This retrospective cohort study included patients who underwent surgical debridement for necrotizing fasciitis between January 2021 and January 2023 in Civil Hospital, Karachi.

**Data Collection:** Electronic medical records reviewed, collecting information on patient demographics, comorbidities, wound characteristics, and post-debridement management.

**Groups:** Patients were divided into two groups based on their post-debridement wound management:

- Group A: Serial Debridement
- Group B: Daily Dressings

**Outcome Measures:** The primary outcome was the clinical improvement rate, defined as the proportion of patients whose wounds showed signs of healing without progression of necrotizing fasciitis [6]. Secondary outcomes included length of hospital stay, number of debridement, and complications [7].

**Statistical Analysis:** Descriptive statistics were used to summarize patient demographics, and comparisons between groups were made using chi-squared tests for categorical variables and t-tests for continuous variables.

## Results

A total of 80 patients were included in the analysis, with 42 in Group A (serial debridement) and 38 in Group B (daily dressings). The mean age was 28.3 years, and both groups had a male predominance.

**Clinical Improvement:** Group A (serial debridement) exhibited a significantly higher rate of clinical improvement compared to Group B ( $p < 0.05$ ). 37 patients in Group A showed signs of wound healing without disease progression (Figure 2), while only 32 patients in Group B achieved this outcome (Figure 1).

**Length of Hospital Stay:** Group A also had a shorter mean length of hospital stay (11.5 days) compared to Group B (14.7 days) ( $p < 0.05$ ).

**Number of Debridement:** On average, patients in Group A required fewer debridements (mean 2.3) compared to Group B (mean 3.1) ( $p < 0.05$ ).

**Complications:** The incidence of wound-related complications was lower in Group A than in Group B, with fewer cases of secondary infections, and tissue loss.

## Discussion

This study demonstrates that serial debridement may offer superior clinical outcomes compared to daily dressings in patients who have undergone debridement for necrotizing fasciitis. Patients in the serial debridement group had a higher rate of clinical improvement, shorter hospital stays and required fewer debridement. Additionally, the incidence of wound-related complications was lower in the serial debridement group. These findings suggest that serial debridement may be a more effective post-debridement management strategy.

## Challenges and Future Directions

Despite the potential benefits of both serial debridement and daily dressings, several challenges persist in their implementation and evaluation. One major challenge is the heterogeneity of patient populations and disease severity, which may influence treatment outcomes and complicate direct comparisons between management strategies. Additionally, variations in surgical techniques, wound care protocols, and antimicrobial regimens further contribute to the complexity of interpreting study findings [8].

Future research efforts should address these challenges through well-designed prospective studies with standardized protocols and larger sample sizes. Comparative effectiveness research incorporating patient-reported outcomes and quality-of-life measures can provide valuable insights into the holistic impact of different management strategies on patients' well-being [9]. Furthermore, cost-effectiveness analyses are essential to assess the economic implications of serial debridement versus daily dressings, considering healthcare resource utilization and long-term outcomes.

Collaborative multicenter studies and systematic reviews/meta-analyses can enhance the generalizability and robustness of findings by pooling data across diverse healthcare settings and geographic regions. Moreover, advances in wound care technologies, such as novel dressings, antimicrobial agents, and adjunctive therapies (e.g., hyperbaric oxygen therapy), warrant investigation to optimize treatment outcomes and minimize complications in patients with necrotizing fasciitis.

## Clinical Implications

In the absence of definitive evidence favoring one approach over the other, clinicians must individualize post-debridement management strategies based on the patient's clinical presentation, comorbidities, wound characteristics, and institutional resources. A multidisciplinary approach involving infectious disease specialists, wound care nurses, and surgeons is essential for comprehensive assessment and tailored treatment planning.

Regular reassessment of the wound, monitoring for signs of infection recurrence, and timely adjustment of management strategies are crucial for optimizing outcomes and minimizing complications. Shared decision-making with patients and their families, coupled with clear communication regarding the rationale, risks, and expected outcomes of different management options, is paramount in promoting patient engagement and satisfaction.

## Patient-Centered Care

In addition to clinical efficacy and resource utilization, it's imperative to emphasize patient-centered care in the management of necrotizing fasciitis. Patients facing this condition often experience significant physical and emotional distress, along with potential long-term sequelae. Therefore, treatment decisions should prioritize the patient's comfort, dignity, and overall well-being.

Healthcare providers must ensure clear and empathetic communication with patients and their families, providing adequate information about the nature of the condition, treatment options, potential risks, and expected outcomes. Shared decision-making empowers patients to participate in their care actively, fostering trust and collaboration between healthcare professionals and patients [10].

Furthermore, comprehensive supportive care addressing pain management, psychological support, nutritional support, and rehabilitation services is essential to optimize the patient's recovery and quality of life. This holistic approach acknowledges the multifaceted impact of necrotizing fasciitis on patients and underscores the importance of addressing their physical, emotional, and social needs throughout the treatment journey [11].

## Education and Awareness

Enhancing awareness and education among healthcare professionals, patients, and the general public is crucial for early recognition, prompt intervention, and prevention of necrotizing fasciitis. Educational initiatives should focus on risk factors, clinical manifestations, diagnostic criteria, and management principles to facilitate timely referral, accurate diagnosis, and appropriate treatment initiation.

Furthermore, public health campaigns can promote

preventive measures, such as proper wound care, hygiene practices, and early recognition of warning signs, to reduce the incidence and burden of necrotizing fasciitis [12]. Increasing community awareness empowers individuals to seek timely medical attention for suspicious symptoms, potentially leading to earlier intervention and improved outcomes.

## Limitations of Study

This study was conducted in a single institute having a small sample size.

## Conclusion

In patients with necrotizing fasciitis, serial debridement appears to be a more effective approach to post-debridement wound management when compared to daily dressings. This method is associated with higher clinical improvement rates, shorter hospital stays, and a reduced need for repeated debridement. Further prospective studies and randomized controlled trials are to confirm these findings and establish standardized guidelines for post-debridement wound care in patients with necrotizing fasciitis.

Managing necrotizing fasciitis requires a comprehensive and multidisciplinary approach encompassing medical, surgical, and supportive interventions. While the debate between serial debridement and daily dressings continues, the overarching goal remains the same: to optimize patient outcomes and minimize morbidity and mortality associated with this devastating condition.

By fostering collaboration, innovation, and patient-centered care, healthcare professionals can strive to improve the quality of care for individuals affected by necrotizing fasciitis. Continued research, education, and advocacy efforts are essential to advance our understanding of this complex disease and enhance the delivery of evidence-based, compassionate care to patients worldwide.

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**Conflict of Interest:** None

**Clinical Trial Registration:** NA

**Ethical Approval:** Waived Off due to retrospective study (comparative).

## Consent to Participate Declaration:

Informed consent was obtained from all individual participants included in the study. Confidentiality of patient data was strictly maintained, and all data were anonymized before analysis.

The research team ensured that the study was conducted with integrity, transparency, and respect for the dignity, rights, and welfare of the participants. Any potential conflicts of interest were disclosed and managed appropriately.

Furthermore, this research aimed to contribute to scientific knowledge while upholding the highest ethical standards, fostering trust in the research process, and promoting the well-being of participants and the wider community.

### Data Availability Declaration:

All Data Included In This Study Will Be Available and Shall Be Provided On Request Due To Data Privacy Regarding Patients.

### Author's contributions:

N.A.K.: conceived the idea; N.A.K. and I.A.R.: collected the data; N.A.K.: analyzed and interpreted the data; N.A.K., I.A.R., S.A., M.A.: write-up of the manuscript; Z.I.: reviewed and revised the manuscript for intellectual content critically. All authors approved the final version of the manuscript.

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